PENDING CLAIMS AS AMENDED

Claims 1–57. (Canceled)

58. (Currently Amended) A system for distributed packet-based paging, comprising:

a plurality of access nodes configured to provide paging messages, ~~configured to exchange paging information over corresponding access links, the plurality of access nodes serving a plurality of end nodes, each end node being associated with, and configured to receive a page from, at least one of the plurality of access nodes,~~

~~wherein each of the plurality of access nodes comprises at least one of~~ each of the access nodes comprising a paging requirements determination module and a paging resource control module,

wherein each paging requirements determination module is configured to receive and analyze paging information to determine a level of quality of service for a corresponding paging message, ~~determine paging requirements to send to the paging resource control module in communication with an intended end node of the page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides,~~ and

wherein each paging resource control module is configured to ~~provide paging resource control functionality~~ allocate paging resources and generate the corresponding paging message in accordance with the ~~paging requirements received from~~ level of quality of service determined by

the paging requirements determination module. ~~, where the paging resource control functionality includes controlling at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to the intended end node.~~

59. (Currently Amended) An access node for use in a system for distributed packet-based paging, comprising:

a paging requirements determination module; and

a paging resource control module,

wherein the paging requirements determination module is configured to receive and analyze paging information to determine a level of quality of service of a corresponding paging message, and ~~determine paging requirements to send to the paging resource control module in communication with an intended end node of a page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides,~~

wherein the paging resource control module is configured to ~~provide paging resource control functionality~~ allocate paging resources and generate the corresponding paging message in accordance with the ~~paging requirements received from~~ level of quality of service determined by the paging requirements determination module. ~~, where the paging resource control functionality includes controlling at least one of (i) paging resources, (ii) paging operations or (iii) the generation of pages to the intended end node, and~~

~~wherein the access node is configured to exchange paging information with a second access node in the system for distributed packet-based paging over an access link, and to serve at least one end node, each of the at least one end node being associated with, and configured to receive the page from, at least one access node.~~

60. (Currently Amended) The access node of claim 59, wherein the paging requirements determination module further ~~comprising~~ comprises:

a monitoring agent module that determines when to initiate a page to the intended end node;

a tracking agent module that tracks the location of end nodes based on received location update signals; and

an anchor paging agent module that coordinates page request signaling to the intended node.

61. (Previously Presented) The access node of claim 59, wherein the paging resource control module further comprises:

a local paging agent module configured to coordinate signaling between the paging requirements determination module and other access nodes.

62. (Currently Amended) The access node of claim [[59]] 109, wherein the exchange of the paging information is based on an Internet protocol (IP).

63. (Currently Amended) The access node of claim 62, wherein the paging requirements determination module is further configured to determine the ~~paging requirements~~ level of quality of service based on matching IP datagrams to specific paging requirements.

64. (Canceled)

65. (Currently Amended) The access node of claim [[64]] 109, wherein the QoS comprises a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency information and specifies an upper bound on paging delay.

66. (Currently Amended) The access node of claim [[64]] 109, wherein the QoS is one of a plurality of levels.

67. (Currently Amended) The access node of claim [[64]] 109, wherein the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.

68. (Currently Amended) The access node of claim [[59]] 109, wherein the determined ~~paging requirements comprise~~ level of quality of service comprises determining whether a plurality of paging requests are associated as a group with a common quality of service indicator; and

the paging resource control functionality comprises allocating a fraction of paging channel capacity or paging transmission opportunities to the plurality of page requests associated with the group.

69. (Currently Amended) The access node of claim [[59]] 109, wherein the determined ~~paging requirements comprise~~ level of quality of service comprises information indicating a state of device operation in which an end node to which the page is directed is to operate after receiving the page.

70. (Currently Amended) A method for communicating paging information in a system for distributed packet-based paging, comprising:

~~exchanging paging information between a plurality of access nodes over corresponding access links;~~

~~providing a page to at least one of a plurality of end nodes associated with, and configured to receive the page from, at least one access node of the plurality of access nodes;~~

~~providing the at least one access node comprising at least one of a paging requirements determination module and a paging resource control module;~~

determining~~, by the paging requirements determination module, paging requirements~~ a level of quality of service for a paging message by receiving and analyzing paging information at a paging requirements determination module within an access node; and ~~to send to the paging resource control module in communication with an intended end node of the page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field or~~

~~a payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides; and~~

~~controlling, by the paging resource control module,~~ allocating paging resources and generating the paging message from a paging resource control module within the access node in accordance with the ~~paging requirements received from~~ level of quality of service determined by the paging requirements determination module. ~~, at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to the intended end node.~~

71. (Previously Presented) The method of claim 70, further comprising:

determining, by the paging requirements determination module, when to initiate a page to the intended end node;

tracking, by the paging requirements determination module, the location of end nodes based on received location update signals; and

coordinating, by the paging requirements determination module, page request signaling to the intended end node.

72. (Previously Presented) The method of claim 70, further comprising:

coordinating signaling, by the paging resource control module, between the paging requirements determination module of one access node and other access nodes.

73. (Currently Amended) The method of claim [[70]] 110, wherein the exchange of the paging information is based on an Internet protocol (IP).

74. (Currently Amended) The method of claim 73, wherein the determining of the ~~paging requirements~~ level of quality of service comprises determining [[the]] paging requirements based on matching IP datagrams to specific paging requirements.

75. (Canceled)

76. (Currently Amended) The method of claim [[75]] 110, wherein the determining of the ~~paging requirements~~ level of quality of service (QoS) comprises determining that the QoS comprises a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency information and specifies an upper bound on paging delay.

77. (Currently Amended) The method of claim [[75]] 110, wherein the determining of the ~~paging requirements~~ level of quality of service (QoS) comprises determining that the QoS is one of a plurality of levels.

78. (Currently Amended) The method of claim [[75]] 110, wherein the determining of the ~~paging requirements~~ level of quality of service (QoS) comprises determining that the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.

79. (Currently Amended) The method of claim [[70]] 110, wherein the determining of the ~~paging requirements~~ level of quality of service comprises determining whether a plurality of paging requests are associated as a group with a common quality of service indicator; and further comprising:

allocating by the paging resource control module a fraction of paging channel capacity or paging transmission opportunities to the plurality of page requests associated with the group.

80. (Currently Amended) The method of claim [[70]] 110, wherein the determining of the ~~paging requirements~~ level of quality of service comprises determining that the paging requirements comprise level of quality of service comprises information indicative of a state of device operation in which an end node to which the page is directed is to operate after receiving the page.

81. (Currently Amended) A computer program product comprising:

a computer readable medium comprising instructions for:

~~exchanging paging information between a plurality of access nodes in a system for distributed packet based paging over corresponding access links;~~

~~providing a page to at least one of a plurality of end nodes associated with, and configured to receive the page from, at least one of the plurality of access nodes;~~

receiving and analyzing paging information at ~~determining, by~~ a paging requirements determination module in an access node; ~~of the plurality of access nodes,~~

determining, at the paging requirements determination module in the access node, a level of quality of service for a paging message in accordance with the paging information; ~~paging requirements to send to a paging resource control module in the access node of the plurality of access nodes, in communication with an intended end node of the page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides, and~~

~~controlling, by the~~ allocating paging resources and generating the paging message at a paging resource control module in the access node, in accordance with the ~~paging requirements received from~~ level of quality of service determined by the paging requirements determination module. ~~, at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to the intended end node.~~

82. (Previously Presented) The computer program product of claim 81, further comprising instructions for:

determining, by the paging requirements determination module, when to initiate the page to the intended end node;

tracking, by the paging requirements determination module, the location of end nodes based on received location update signals; and

coordinating, by the paging requirements determination module, a page request signaling to the intended end nodes.

83. (Previously Presented) The computer program product of claim 81, further comprising instructions for:

coordinate signaling by the paging resource control module between the paging requirements determination module of one access node and other access nodes.

84. (Currently Amended) The computer program product of claim [[81]] 111, wherein the exchange of the paging information is based on an Internet protocol (IP).

85. (Previously Presented) The computer program product of claim 84, wherein the instructions for determining the ~~paging requirements~~ level of quality of service comprise instructions for determining the ~~paging requirements~~ level of quality of service based on matching IP datagrams to specific paging requirements.

86. (Canceled)

87. (Currently Amended) The computer program product of claim [[86]] 111, wherein the instructions for determining the ~~paging requirements~~ level of quality of service (QoS) comprise instructions for determining that the QoS includes a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency and specifies an upper bound on paging delay.

88. (Currently Amended) The computer program product of claim [[86]] 111, wherein the instructions for determining the ~~paging requirements~~ level of quality of service (QoS) comprise instructions for determining that the QoS is one of a plurality of levels.

89. (Currently Amended) The computer program product of claim [[86]] 111, wherein the instructions for determining the ~~paging requirements~~ level of quality of service (QoS) comprise instructions for determining that the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.

90. (Currently Amended) The computer program product of claim [[81]] 111, wherein the instructions for determining the ~~paging requirements~~ level of quality of service comprise instructions for determining whether a plurality of paging requests are associated as a group with a common quality of service indicator; and further comprise instructions for allocating, by the paging resource control module, a fraction of paging channel capacity or paging transmission opportunities to the plurality of page requests associated with the group.

91. (Currently Amended) The computer program product of claim [[81]] 111, wherein the instructions for determining the paging requirements comprise instructions for determining that the paging requirements comprise information indicative of a state of device operation in which an end node to which the page is directed is to operate after receiving the page.

92. (Currently Amended) An access node for use in a system for distributed packet-based paging, comprising:

~~means for exchanging paging information between a plurality of access nodes;~~

~~means for providing a page to at least one of a plurality of end nodes associated with, and configured to receive the page from, at least one of the plurality of access nodes;~~

means for receiving and analyzing paging information to determine a level of quality of service (QoS) for a paging message; ~~determining paging requirements, the paging requirements being determined at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received from another one of the plurality of access nodes and (ii) from stored information uniquely associated with the access node in which the first means resides;~~ and

means for ~~providing paging resource control functionality~~ allocating paging resources and generating the paging message in accordance with the ~~paging requirements received from~~ level of quality of service determined by the means for ~~determining paging requirements~~ receiving and analyzing the paging information. ~~, wherein the paging resource control functionality comprises controlling at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to an intended end node,~~

~~wherein the means for providing paging resource control functionality comprises means for communicating with the intended end node of the page.~~

93. (Currently Amended) The access node of claim 92, wherein the means for ~~determining paging requirements~~ receiving and analyzing paging information comprises:

means for determining when to initiate the page to the intended end node;

means for tracking a location of end nodes based on received location update signals; and

means for coordinating page request signaling to the intended end node.

94. (Currently Amended) The access node of claim 92, wherein the means for ~~providing paging resource control functionality~~ allocating paging resources and generating the paging message comprises:

means for coordinating signaling between the means for ~~determining paging requirements~~ receiving and analyzing paging information of one access node and other access nodes.

95. (Currently Amended) The access node of claim [[92]] 112, wherein the means for exchanging paging information is configured to utilize an Internet protocol (IP).

96. (Currently Amended) The access node of claim 95, wherein the means for ~~determining paging requirements~~ receiving and analyzing paging information comprises means for determining the ~~paging requirements~~ level of quality of service based on matching IP datagrams to specific paging requirements.

97. (Canceled)

98. (Currently Amended) The access node of claim [[97]] 112, wherein the QoS comprises a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency information and specifies an upper bound on paging delay.

99. (Currently Amended) The access node of claim [[97]] 112, wherein the QoS is one of a plurality of levels.

100. (Currently Amended) The access node of claim [[97]] 112, wherein the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.

101. (Currently Amended) The access node of claim [[92]] 112, wherein the means for ~~determining paging requirements~~ receiving and analyzing paging information comprises means for determining whether a plurality of paging requests are associated as a group with a common quality of service indicator; and the means for ~~providing paging resource control functionality~~ allocating paging resources and generating the paging message comprises means for allocating a fraction of paging channel capacity or paging transmission opportunities to the plurality of paging requests associated with the group.

102. (Currently Amended) The access node of claim [[92]] 112, wherein the means for ~~determining paging requirements~~ receiving and analyzing paging information comprises means for determining that the ~~paging requirements comprise~~ level of quality of service corresponds to

information indicating a state of device operation in which an end node to which the page is directed is to operate after receiving the page.

103. (Currently Amended) An end node for use in a system for distributed packet-based paging, comprising:

means for receiving a first page from a first access node ~~having~~ comprising a first paging resource control module and a first paging requirements determination module, where the first paging resource control module ~~generates~~ is configured to allocate paging resources and generate the first page to the end node in accordance with a first level of quality of service determined based on paging information ~~on the basis of a data message~~ received by [[a]] the first paging requirements determination module; and

means for receiving a second page, different from the first page, from a second access node ~~having~~ comprising a second paging resource control module and a second paging requirements determination module, where the second paging resource control module ~~generates~~ is configured to allocate paging resources and generate the second page in accordance with a second level of quality of service determined based on ~~the basis of~~ the same ~~data message~~ paging information received by [[a]] the second paging requirements determination module. ;

~~wherein the first access node and the second access node are each configured to exchange paging information corresponding to the first page and the second page over corresponding access links, and wherein each of the first and second paging requirements determination modules is configured to determine paging requirements to send to the first and second paging resource control module, respectively, currently in communication with an intended end node of~~

~~the first and second page, respectively, the respective paging requirements being derived at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding one of the access links and (ii) from stored information uniquely associated with the first or second access node, respectively, in which the respective paging requirements determination module resides, and each respective paging resource control module is configured to provide paging resource control functionality in accordance with paging requirements received from the respective paging requirements determination module, where the paging resource control functionality includes controlling at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to the respective intended end node.~~

104. (Currently Amended) A method for receiving a page in a system for distributed packet-based paging, comprising:

receiving a first page from a first access node ~~having~~ comprising a first paging resource control module and a first paging requirements determination module, where the first paging resource control module ~~generates~~ is configured to allocate paging resources and generate the first page to the end node in accordance with a first level of quality of service determined based on paging information ~~on the basis of a data message~~ received by [[a]] the first paging requirements determination module; and

receiving a second page, different from the first page, from a second access node ~~having~~ comprising a second paging resource control module and a second paging requirements determination module, where the second paging resource control module ~~generates~~ is configured

to allocate paging resources and generate the second page in accordance with a second level of quality of service determined based on ~~the basis of~~ the same ~~data message~~ paging information received by [[a]] the second paging requirements determination module. [[,]]

~~wherein the first access node and the second access node are each configured to exchange paging information corresponding to the first page and the second page over corresponding access links, and wherein each of the first and second paging requirements determination modules is configured to determine paging requirements to send to the first and second paging resource control module, respectively, currently in communication with an intended end node of the first and second page, respectively, the respective paging requirements being derived at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding one of the access links and (ii) from stored information uniquely associated with the first or second access node, respectively, in which the respective paging requirements determination module resides, and each respective paging resource control module is configured to provide paging resource control functionality in accordance with paging requirements received from the respective paging requirements determination module, where the paging resource control functionality includes controlling at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to the respective intended end node.~~

105. (Previously Presented) The end node of claim 103, further comprising means for providing location update signals,

wherein the first access node and second access node are each further configured to determine when to initiate the page to the intended end node, to track a location of respective end nodes based on the location update signals, and to coordinate page request signaling to the intended end node.

106. (Canceled)

107. (Currently Amended) The end node of claim [[106]] 115, wherein the QoS comprises a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency information and specifies an upper bound on paging ~~delayl~~ delay.

108. (Previously Presented) The end node of claim 106, wherein the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.

109. (New) The access node of claim 59, wherein the access node is configured to exchange paging information with a second access node in the system for distributed packet-based paging over an access link, and to serve at least one end node, and

wherein the paging requirements determination module is further configured to determine the level of quality of service (QoS) at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received

over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides.

110. (New) The method of claim 70, further comprising exchanging paging information between a plurality of access nodes over corresponding access links,

wherein the determining of the level of quality of service comprises determining the level of quality of service at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides.

111. (New) The computer program product of claim 81, further comprising instructions for exchanging paging information between a plurality of access nodes in a system for distributed packet based paging over corresponding access links,

wherein the instructions for determining the level of quality of service for the paging message comprise instructions for determining the level of quality of service (QoS) at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides.

112. (New) The access node of claim 92, further comprising means for exchanging paging information between a plurality of access nodes,

wherein the means for receiving and analyzing paging information comprises means for determining the level of quality of service at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides.

113. (New) The end node of claim 103, wherein the first access node and the second access node are each configured to exchange paging information corresponding to the first page and the second page over corresponding access links.

114. (New) The end node of claim 113, wherein each of the first and second paging requirements determination modules is further configured to determine paging requirements to send to the first and second paging resource control module, respectively, currently in communication with an intended end node of the first and second page, respectively, the respective paging requirements being derived at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding one of the access links and (ii) from stored information uniquely associated with the first or second access node, respectively, in which the respective paging requirements determination module resides.

115. (New) The end node of claim 114, wherein each respective paging resource control module is further configured to provide paging resource control functionality in accordance with paging requirements received from the respective paging requirements determination module, where the paging resource control functionality includes controlling at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to the respective intended end node.

116. (New) The method of claim 104, wherein the first access node and the second access node are each configured to exchange paging information corresponding to the first page and the second page over corresponding access links.

117. (New) The method of claim 116, wherein each of the first and second paging requirements determination modules is further configured to determine paging requirements to send to the first and second paging resource control module, respectively, currently in communication with an intended end node of the first and second page, respectively, the respective paging requirements being derived at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding one of the access links and (ii) from stored information uniquely associated with the first or second access node, respectively, in which the respective paging requirements determination module resides.

118. (New) The method of claim 117, wherein each respective paging resource control module is further configured to provide paging resource control functionality in accordance with paging requirements received from the respective paging requirements determination module, where the paging resource control functionality includes controlling at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to the respective intended end node.